LOCKHEED MARTIN SPACE SYSTEMS COMPANY

MISSION SUCCESS® BULLETIN

April 7, 2003 MICHOUD OPERATIONS

NASA targets fall for earliest possible return to flight

Local investigation continues with three-pronged approach

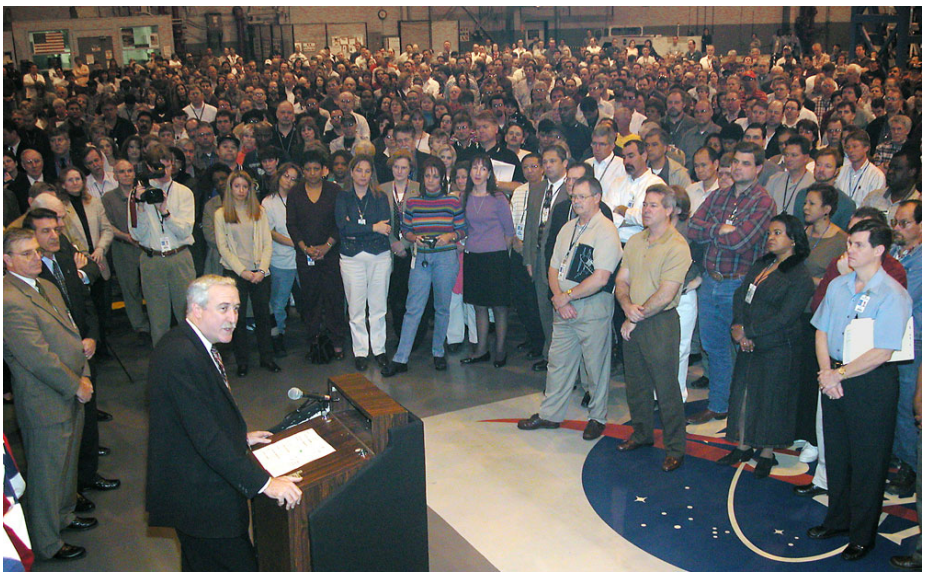
The NASA Space Shuttle program office has taken the first steps to return to safe flight as soon as possible.

While acknowledging that there is much to be done in support of the Columbia Accident Investigation Board (CAIB), **Ron Dittemore**, Space Shuttle program manager, recently identified several design and operational improvements for review and possible implementation.

Dittemore classified the following upgrades as Return to Flight activities:

- Review ET bipod area and recommend changes to insulation design and implementation to preclude any foam loss.
- Use Department of Defense satellites and the International Space Station for on-orbit shuttle inspection and repair. Identify tile and wing leading edge inspection and repair options.
- Review ground-based launch and ascent photography and radar.
- Place extra cameras on shuttle components to record launch and ascent.
- Examine possible trajectory modifications to minimize re-entry heating.

Since February 1, CAIB members have visited Michoud frequently to understand ET manufacturing processes and interview employees in their quest to find clues to Columbia's break-up. The board has said it has no favored accident theory, but much of the attention remains focused on possible ET debris that struck Columbia, NASA's oldest orbiter, at 81 seconds into flight on January 16.



NASA Administrator Sean O'Keefe visited Michoud shortly after the Columbia accident and reassured employees: "We will persevere; we'll get through this." In a subsequent Michoud visit at the Service Life Extension Program Summit, O'Keefe said NASA expects the shuttle to fly past 2020 to expand and operate the International Space Station and explore space.

A joint team of NASA and Lockheed Martin investigators is working closely with the CAIB. The three-pronged focus of their activities is fault tree investigation, data analysis and component testing, including dissection of ET bipod ramp and flange areas.

Activities continue on a redesign of the ET bipod area that was begun following the STS-112 mission in October. Michoud employees also are looking at camera locations on the vehicle that would provide additional information on ET and Solid Rocket Boosters performance.

High velocity impact tests will begin later this month at the Southwest Research Institute in San Antonio in order to understand what effect foam debris may have on orbiter tiles, leading edge and closeout panels.

"I'd like to personally thank each employee for their commitment to our goals of finding the cause of the Columbia accident and returning to safe flight as soon as possible," said **Dennis Deel**, president, Michoud Operations.

"The last two months have been extremely difficult, but I believe that we've stayed focused on what needs to be done. I think the CAIB recognizes that as well."

Michoud Operations presents Build Process Team of the Year

Lockheed Martin conducted its own version of the Oscar awards on January 28 as astronaut **Duane Carey** bestowed the 2002 Build Process Team of the Year award on the winning team.

Out of a four-team competition, the Weld Operations – Weld Sub-Assembly II team led by **Mike McGehee** took top honors. Judges evaluated the 45-member team on having the best improvements to cost, safety, quality and hardware scheduling.

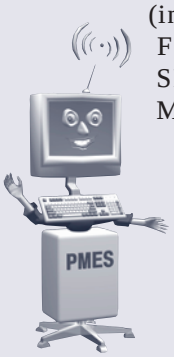
The team performed at 86 percent zero defects in welds, charged only one accident from July 2001 to December 2002, estimated labor savings of over 549 man-hours per year and lastly implemented ten of 27 recommendations.

"I believe two big keys to the winning team's success are the range and balance of improvement candidates – Safety, Quality, Performance – and the relationships established with the various support groups hile implementing these improvements," said **Hal Simoneaux**, director, Manufacturing and Test.

The other three competing teams – Super Light Ablator Operations Group A team, Weld Sub-Assembly Area 3 team and Intertank and Stringer team – also showed significant improvements in these areas in the past year.

Paperless Manufacturing Status

- 2nd Pilot started 1/27 in Weld Operations (includes Weld Sub-Assembly 1 and 3)
- 3rd Pilot started 3/25 in Detail Fabrication (includes Harness Fab, Tube Shop, SLA Shop and Machine Shop)



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Congratulations to the Weld Operations Sub-Assembly II team, the Build Process Team (BPT) of the Year. ***Seated from left:*** *Veronica Vilen, George Huber, Onicka Walker, Andy Clouatre, Debbie Benz, Mike McGehee (Team Lead), Janice Capello, Son Nguyen, Keith McClaine, Cheryl Iwanczyk (BPT Administrator) and Mike Javery (vice president, Production Operations).* ***Second row:*** *Daniel Galbraith, Bret Holt, Jesse Hawkins, Mike Mathes, James Moffett, Fred Schule, Mitch Huguet, Richard Oramous, Randall Kliebert, Robert Cooksey and Sheri Torres.* ***Third row:*** *Carroll Flurry, Max Rabalais, Guillermo Ladut, Larry Cox, Charles Kennon, Robert Fuller, Cliff Mitchell, Lloyd Demmons, John Trowbridge, Benny Robinson (Assistant Team Lead) and Richard Michel.* ***Fourth row:*** *George Pender, Hal Simoneaux (director, Mfg. & Test), Francis Hotard, William Walsten, Kwok Tsang, Charles Anderson, astronaut Duane Carey, Dilip Dudgaonkar, Larry Zurek, Sam Moley and Toma Sharkey. Not pictured: Todd Duhon, Robert Larche, Steve Reeves, Ronald Smallwood and Ray Zibilich.*

Lunch with astronauts provides a boost to employee morale

Recently Michoud's Space Flight Awareness (SFA) office hit upon the idea of hosting employee lunches with astronauts. Since the astronauts were here working on the STS-107 investigation, why not do lunch?

"In light of Columbia's accident, I think it's helping morale," said **Russell Arthur,** SFA program coordinator. "We bring in 16 employees from various departments who rarely have a chance to talk to astronauts."

Astronaut Tony Antonelli signs a launch photo for Glen Dobbins while Geneva Robertson and Carlos Yingst look on.

Willie Howard, Production Operations, agreed. "These are very helpful, nice and intimate, close and personal with the astronauts – a great experience."

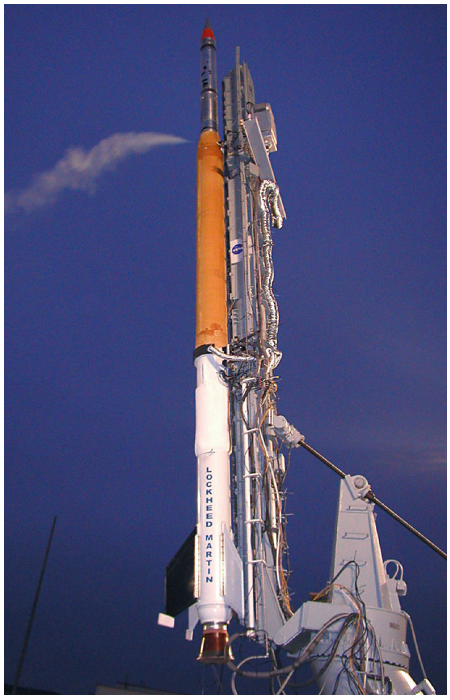
Two astronauts come to each lunch. "For us, it's good to see the people who put the tank together," said astronaut **Alvin Drew**. "They're not just faceless folks. It really is an engineering miracle."

Employees say they appreciate the astronauts' candor. "Everybody's kind of down in the dumps with the tragedy," said **James Brooks**, Prod Ops. "This is special getting to talk with the astronauts. I'll go back to my area and tell them this is something to look forward to."

The lunches are twice a week in Bldg 102 Special Events Room.

"I've been helping with the administrative duties of the investigation and just to get away from that stress for a while is very nice," said **Sandy Sollberger**, Program Management & Technical Operations.

Year 2003 commemorates a milestone.
Lockheed Martin marks its 30th year of designing, building and testing External Tanks in New Orleans this year. Over three decades, the company has pumped $3.2 billion in payroll into the local economy, a significant impact to the New Orleans area and the state of Louisiana.



Michoud's Hybrid Sounding Rocket prepares to streak into the sky at 2½ times the speed of sound.

Hybrid rocket has successful launch

It was worth the wait. After months of delay, just before Christmas, Michoud with NASA support and a NASA payload launched its Hybrid Sounding Rocket from Wallops Flight Facility in Virginia.

Perhaps the largest Hybrid Sounding Rocket ever launched at 57 feet long and two feet in diameter, the rocket used liquid oxygen and solid fuel to generate 60,000 pounds of thrust to reach an altitude of 42km with a burn time of approximately 34 seconds.

"This flight data can be used to improve our analytical models and predictions, which gives us a database and tools to design future hybrids and hybrid scale-ups," said **Randy Tassin**, vice president, Program Management & Technical Operations.

The rocket also demonstrated that hybrid propulsion technology offers a low-cost solution for delivering payloads. Hybrids present significant advantages over solid fuel propellants in that they're non-explosive, throttleable, affordable and environmentally friendly.

Ready for some volunteering?
Members of the 2003 Employee Volunteer Organization who will plan and lead this year's volunteer activities include from left: James Moffett, president; retiree Joe Litfin; Dina Michel; Rob Carey; Linda Savage-Regan, vice president; Netsy Wheeler, secretary; Steve Garner, treasurer; and Sonya Johnson. Not pictured are Marc Church, ex-officio president; and Bill Burtch.

MILESTONES

Employees celebrating anniversaries with Lockheed Martin in January, February and March

25 years
Hassan Boroujerdi
Brian Dafni
Bruce Donnell
Gregg Gammon
Walter Jones
Anthony Ponceti
Jay Shugart

20 years
Renee Allison
Victor Atkins
Roseann Augustine
Ronald Baillif
Clarence Barra
Larry Barras
Alton Blancher
Willie Brooks
Doretha Brown
Terry Cardaro
Louis Chapoton
Earl Corley
Clovis Crocker
Louis Davis
Gene Diaz
Hayward Ducre
James Dunn
Victor Dyer
Melissa Earhart
Kelley Easley
Michael Erato
Barry Erminger
Arnold Fazande
Merlin Fields
Stephen Fisse
Anthony Flot
Diamond Fourcade
Jerry Gosin
Judith Green
Per Hansen
Mark Hyde
Edward Jenkins
Eugene Jezewski
Scott Johnson
Ivory Jordan
Lester Kendrick
Ralph LeBoeuf
George Lesage
Ronald Marti
Alan McDaniel
Tommy McMichael
Barbara Messa
Kenneth Miller
Steven Miller
Barbara Mix
David Newman
William O'Daniel
Jeremiah O'Rourke
Edwin Peneguy
Karen Polit
Ronald Richard
George Rogers
Michael Rounds
Henry Sissac
Roger Sissac
Rudolph Tillman
William Turpin
William Ussery
Edward Watts
George Wehrlin
Roland Williams
Ronald Williams
William Worrill
Denise Younger

15 years
Michael Amman
James Cunningham
Cornelius De Hoog, Jr.
Charles Finch
Steve Fredrick
Daniel Kilroy
Larry McCall
Anna McCormick
Glenda Pates
Thomas Piff
Charles Poolson
Heather Quintini
Pamela Rouleau
Joseph Simpson
Garrey Watkins

10 years
Cynthia Pustanio

5 years
Glynn Adams
Elliott Brett
Roger Brown
Norma Bute
Steven Chandler
Gregory Duhe
Patrick Emerson
Pamela Ford
Benjamin Hendrick
Jody Kliebert
John Loposser
Michelle Morlier
Ke Nguyen
Joseph Pierre
Ricky Plaisance
Christopher Strain
Clifford Taylor
Lucius Watts
Isaac Williams
Damian Woods

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Editor: Harry Wadsworth

Graphics, Photography:
Kevin Barré, Darren Kearney
Horace Williams

Contributors:
Kevin Barré, Marion LaNasa,
Toni McCormick, Horace Williams

Lockheed Martin
Space Systems Company
Michoud Operations

Telephone: (504) 257-0094
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Lockheed Martin Space Systems Company
Michoud Operations
P. O. Box 29304
New Orleans, LA 70189-0304

Please send mailing address updates to: sharon.h.hansen@maf.nasa.gov